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# INDOT 2000-2025 Long Range Plan

## System Definition

### Overview

The state highway system definition process attempts to identify the importance of the various elements of the system in terms of the movement of people and goods. The various segments of the highway system are evaluated in terms of statewide significance relative to levels of passenger or freight operations. A major focus is the enhancement of connectivity between major activity centers to support the state's economy. Highway corridors were evaluated on the basis of:

- Accessibility measures between major urban area concentrations
- Designation as a Principal Arterial on the FHWA Functional Classification System
- Designation as part of the National Highway System
- High volumes of commercial traffic and commodity movements
- Concentrations of high passenger vehicle traffic volumes

An overall strategy must be developed so that individual investments fit into a larger statewide program. Within this strategy, individual corridor needs must be identified and prioritized.

### Planning Level Corridor Hierarchy

Many of the traditional classification schemes used to categorize highways and corridors are discussed in the section "Other Classification Schemes" in this chapter. These schemes provide important information regarding the Indiana highway system. Part of the development effort for the 2000-2025 Long Range Plan involved analyzing this information to develop a new and simplified planning-level corridor classification scheme for statewide planning purposes. This new hierarchy has three levels:

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### **1) Statewide Mobility Corridors**

These corridors are the top-end of the highway system and are meant to provide mobility across the state. They provide safe, free flowing, high-speed connections between the metropolitan areas of the state and surrounding states. They serve as the freight arteries of the state and are thus vital for economic development. INDOT has as a strategic goal to directly connect metropolitan areas of 25,000 population or greater. See Figure 6-1.

### **2) Regional Corridors**

These corridors are the middle tier of the highway system and are meant to provide mobility within regions of the state. They provide safe, high-speed connections.

### **3) Local Access Corridors**

These corridors make up the remainder of highway system. They are the bottom level of system and are used for lower speed travel, and provide access between locations of short distances (10-15 miles).

## **Characteristics of Planning Corridors**

The basics of how these corridors will look and operate as well as how INDOT will view these designations to guide future investment are defined here:

### **Statewide Mobility Corridors**

Statewide Mobility Corridors serve as the connection between major metropolitan areas of the state and neighboring states, provide macro-level accessibility to cities and regions around the state, and play a vital role in the economic development of the state.

The Statewide Mobility Corridor System consists of the Indiana portion of the Interstate System and includes most other routes included in the Principal Arterial System. Other route segments considered essential to providing reasonably structured highway mobility corridors include a South Suburban Expressway in Northwest Indiana, I-69 Extension in Southwest Indiana, an Anderson/Muncie to Columbus connection in Central/Southeastern Indiana, and a US 231 connection from the Bloomington area to Lafayette. These four corridors are shown in Figure 6-5, though their locations will be determined through formal environmental assessment.

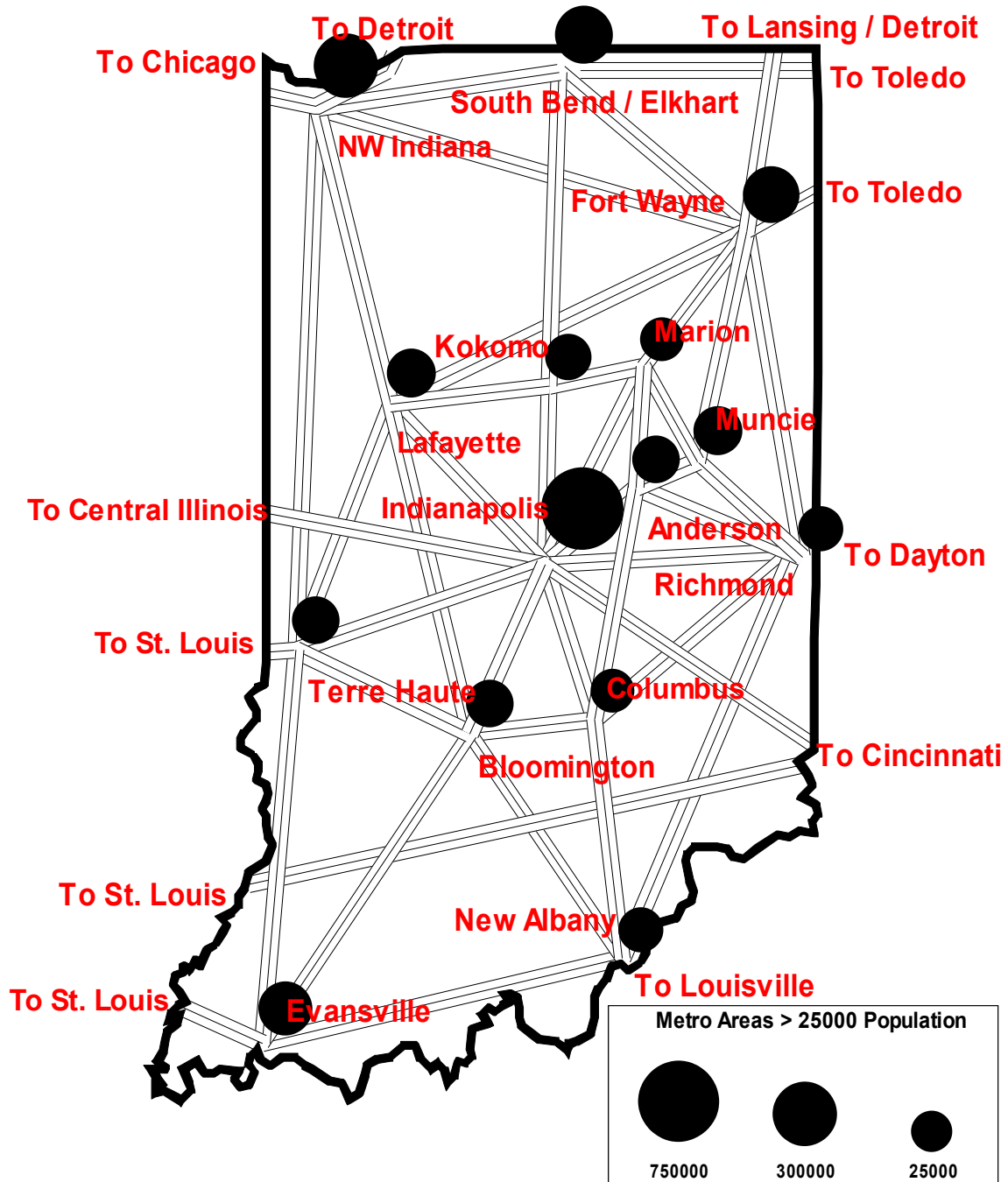
Characteristics:

- Upper level design standards
- High speed
- Free flowing conditions
- Serves long distance trips
- Large through volumes of traffic

- Heavy commercial vehicle flows
- Carry longer distance commuter traffic
- Generally multi-lane, divided
- Full access control desirable, no less than partial access control
- Railroad and highway grade separations desirable
- Desirable to by-pass congested areas
- No non-motorized vehicle/pedestrian interaction
- Major river crossing

Figure 6-1

## Statewide Mobility Connections between Population Centers



## **Regional Corridors**

Regional Corridors serve as a connection to smaller cities and regions, feed traffic to the Statewide Mobility Corridors, and provide for regional accessibility.

Characteristics:

- Mid-level design standards
- High to moderate speed
- Free-flow to the extent practicable in rural areas
- Serves medium distance trips
- Carry medium distance commuter traffic
- Moderate through volumes of traffic
- Moderate commercial vehicle flows
- Potential for heavy local traffic volumes
- Typically, at grade intersections with highways and railroads, with consideration for railroad separation
- High-level two-lane or multi-lane
- Partial access control desirable
- Conventionally routed through cities and towns
- Moderate interaction with non-motorized vehicles and pedestrians

## **Local Access Corridors**

Local Access Corridors serve intra- and inter-county short distance trips, provide access to local residences and businesses, and provide access to rural areas and small towns.

Characteristics:

- Lower-level design standards
- Moderate to low speed
- At-grade intersections with highways and railroads
- Minimal access control
- Short distance trips
- Low through traffic volumes

- Moderate local traffic volumes
- Typically two-lane with multi-lane exceptions
- Frequent interaction with non-motorized vehicles and pedestrians
- Routed through cities and towns

## Analysis of Existing System

Twelve Indiana metropolitan areas, and these additional urban areas, were evaluated in terms of point to point actual travel time over existing highways compared to the “ideal” travel time (a straight-line connection at legal speed limits) between the same points.

The ratio of actual travel time to a predetermined ideal travel time between these twelve communities and other related major out-of-state locations yielded results ranging from 1.107 to 1.860. Thus, the concept of multi-tiered corridors evolved as a means of supporting the process of providing comparable access between service areas and by defining types of improvement required and in projecting time frames for making specific project type improvements that would best contribute to maximizing overall community connectivity. Naturally, specific criteria and route upgrade options in support of these redefined corridor definitions would be required and have been basically outlined above. The results of this sample community to community accessibility study are shown in Figures 6-2, 6-3 and 6-4.

Figure 6-2

System Performance Results (ratio of actual travel time to ideal travel time)														
	Indianapolis	Evansville	N W Indiana	S. Bend/Elk.	Fort Wayne	Anderson	Muncie	Kokomo	Lafayette	Bloomington	Terre Haute	Columbus	Richmond	Marion
Indianapolis		1.395	1.107	1.321	1.248	1.424	1.466	1.343	1.210	1.354	1.160	1.215	1.147	1.403
Evansville	1.395		1.292	1.406	1.329	1.404	1.413	1.397	1.400	1.532	1.292	1.525	1.459	1.406
N W Indiana	1.107	1.292		1.219	1.331	1.328	1.434	1.463	1.122	1.242	1.284	1.125	1.312	1.503
S. Bend/Elk.	1.321	1.406	1.219		1.535	1.444	1.548	1.354	1.437	1.370	1.458	1.318	1.518	1.488
Fort Wayne	1.248	1.329	1.331	1.535		1.242	1.422	1.391	1.396	1.283	1.293	1.276	1.320	1.342
Anderson	1.424	1.404	1.328	1.444	1.242		1.505	1.866	1.386	1.385	1.262	1.450	1.484	1.422
Muncie	1.466	1.413	1.434	1.548	1.422	1.505		1.590	1.414	1.418	1.284	1.514	1.523	1.733
Kokomo	1.343	1.397	1.463	1.354	1.391	1.866	1.590		1.427	1.421	1.503	1.317	1.571	1.517
Lafayette	1.210	1.400	1.122	1.437	1.396	1.386	1.414	1.427		1.388	1.490	1.215	1.291	1.395
Bloomington	1.354	1.532	1.242	1.370	1.283	1.385	1.418	1.421	1.388		1.466	1.561	1.408	1.367
Terre Haute	1.160	1.292	1.284	1.458	1.293	1.262	1.284	1.503	1.490	1.466		1.440	1.178	1.417
Columbus	1.215	1.525	1.125	1.318	1.276	1.450	1.514	1.317	1.215	1.561	1.440		1.561	1.363
Richmond	1.147	1.459	1.312	1.518	1.320	1.484	1.523	1.571	1.291	1.408	1.178	1.561		1.543
Marion	1.403	1.406	1.503	1.488	1.342	1.422	1.733	1.517	1.395	1.367	1.417	1.363	1.543	
Louisville	1.145	1.235	1.123	1.038	1.240	1.270	1.354	1.188	1.163	1.495	1.488	1.179	1.493	1.306
Chicago	1.169	1.294	1.404	1.410	1.368	1.356	1.429	1.442	1.216	1.278	1.279	1.184	1.337	1.529
Cincinnati	1.184	1.244	1.205	1.459	1.447	1.464	1.474	1.389	1.197	1.357	1.229	1.113	1.497	1.420
City Total	20.291	22.023	20.494	22.323	21.463	22.692	23.521	23.179	21.147	22.325	21.523	21.356	22.642	23.154

Figure 6-3

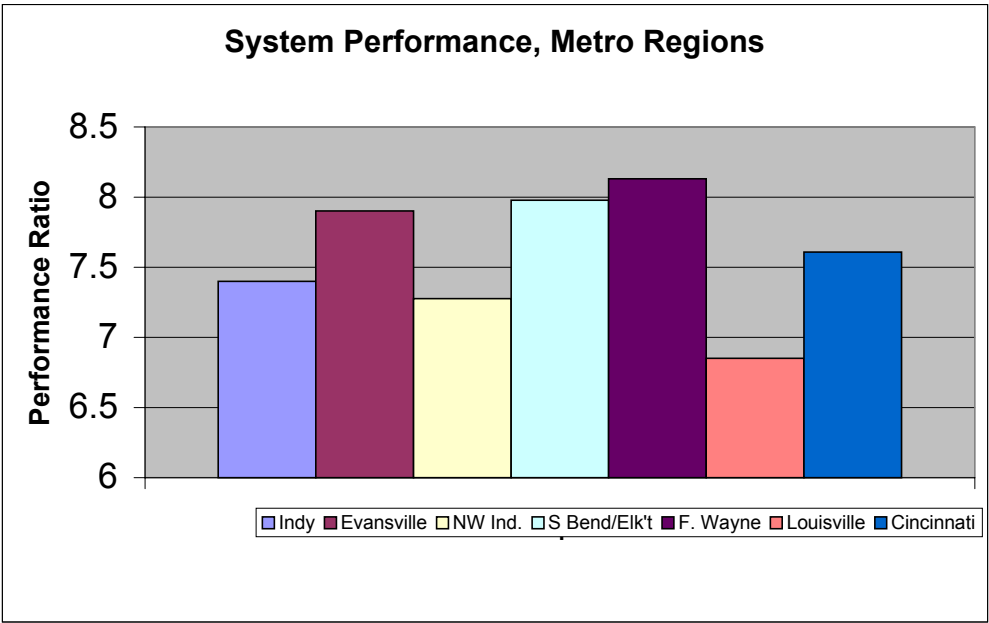


Figure 6-4

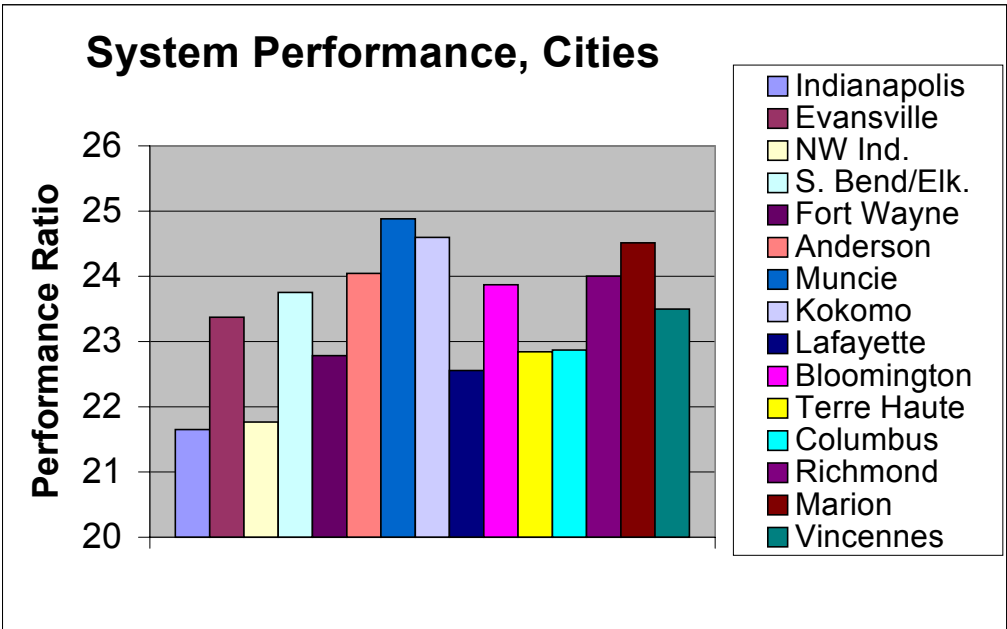
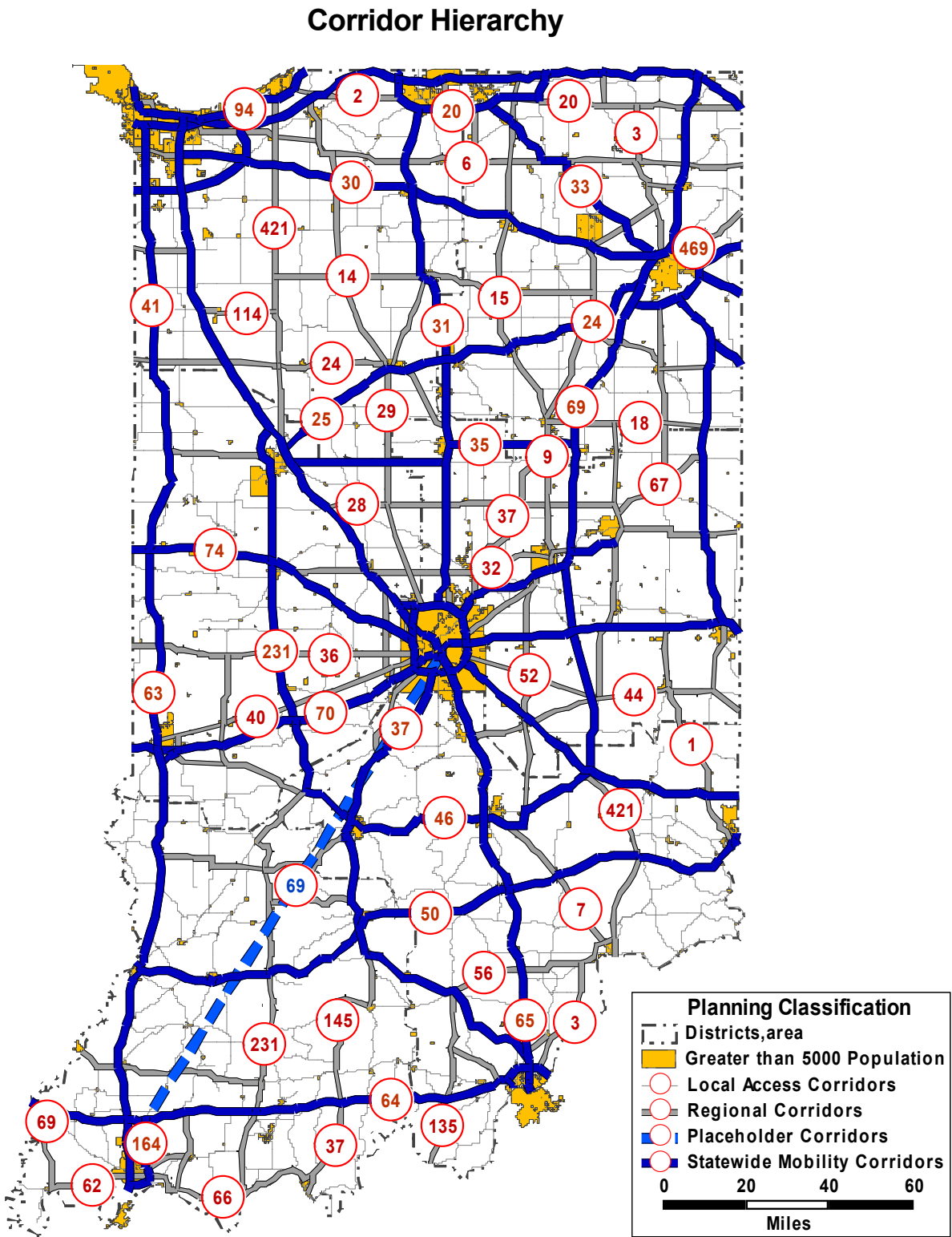


Figure 6-5





## **Other Classification Schemes**

Any segment of the statewide highway system, county road system or city street system has been classified in a multitude of ways. Initially, these route segments are classified in terms of jurisdictional control. Construction, maintenance and oversight of these roadway sections become the responsibility of the State, County or City involved. Following jurisdictional control, the state, in conjunction with the federal government, has defined segments of these roadways as a part of the FHWA Functional Classification System. They can be classified as Interstate, Freeway or Expressway, Principal Arterial, Minor Arterial, Major Collector, Minor Collector, Collector or Local, all as further defined under an area designation of Rural, Small Urban or Urban.

Following these classification breakdowns, segments can be further defined in terms of special interests such as being a part of the National Highway System, Commerce Corridor System, Strategic Highway Network or its Primary Connectors, Heavy Duty Highway Network, National Truck Network, Intermodal Connecting Link, or a Scenic Highway Segment.

Each of these classification systems are further defined below and where appropriate have been depicted on maps attached to this report.

### **Functional Classification System**

The functional classification concept is one of the most important determining factors in highway design. In this concept, highways are grouped by the character of service they provide. The basic principle involved in classifying highway is that roads serve two distinct functions or purposes: moving traffic and providing access. Although most roads serve both functions, the degree that one function predominates over the other determines its classification. Thus, arterial roads mainly provide for traffic service and the local roads mainly provide for access. In between are the collectors, which maintain a relatively equal balance between traffic service and land access.

In the functional classification scheme, the overall objective is that the highway system, when viewed in its entirety, will yield an optimum balance between its access and mobility purposes. If this objective is achieved, the benefits to the traveling public will be maximized.

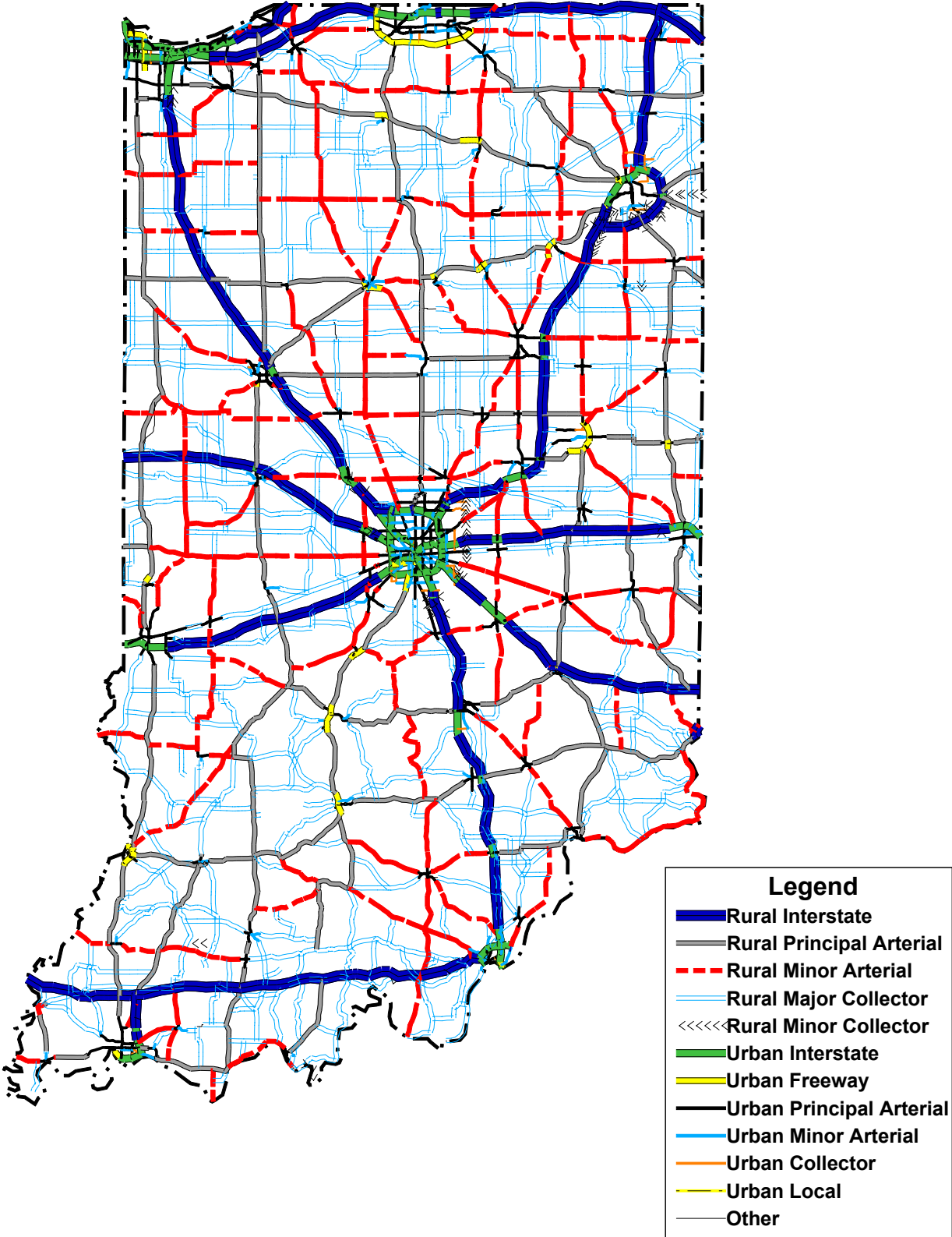
There are many other reasons for functionally classifying roads. Functional classification has often been used to assign jurisdictional responsibility to highways. Functional classification has also been used in fiscal planning, establishing needs, and setting design standards.

Jurisdictional responsibility usually follows functional classification. Indiana, like many other states, has assigned the responsibility for the highest levels (arterials and most major collectors) to INDOT, while local governments generally have been given the responsibility for the lower level roads falling into minor collector and local road systems.

For fiscal planning, the underlying concept is that the funding source should be related to the road's function. Roads that provide for traffic service are financed by vehicle use taxes (fuel tax, registration fees, etc.) supported by federal funding while roads that provide for

Figure 6-6

Functional Classification System



access alone are not federally supported and are financed by property taxes and general revenue.

Highway needs in the form of design standards are also related to functional classification. What may be considered a need on a higher level road may be considered acceptable on a lower level road. For instance, since the purpose of local roads is to provide access to property and not necessarily to move traffic, conditions contributing to lower speeds can be tolerated. By the same token, higher level roads (arterials) provide minimal or non direct property access; therefore, access control is a fundamental consideration in designing this type of facility.

The functional classification system currently in existence in Indiana, as proposed and supported by both INDOT and FHWA, involved analyzing population centers and traffic generators both within the state as well as those in proximity of the state's borders which were then ranked by size. The largest ones were connected together by a continuous interconnected system of roads. Stub connections were avoided wherever possible except where unusual geographic or traffic flow conditions dictated.

Other considerations involved trip length, spacing, degree of access control and coordination with neighboring states. Average trip length was also considered an important factor in classifying roads. Unfortunately, data of this nature frequently was not readily available and therefore, could not be used in determining which roads should function as principal arterials. Roads with longer average trip lengths were usually assigned to higher classifications.

Spacing was also a major consideration. In urban areas, the spacing of arterials was decreased as the population density increased. Parallel roads in the same corridor usually were provided different classifications. Those roads with higher design usually were considered to function as principal arterials while the others were deemed more appropriate to serve localized traffic and provide a needed degree of land access.

Coordination with adjacent states was always considered as an important element in the decision process. Major traffic generators in adjacent states should always be provided with a functional classification designation similar to ours as the routes cross the State lines. A map depicting all functionally classified roads in Indiana is shown in Figure 6-6.

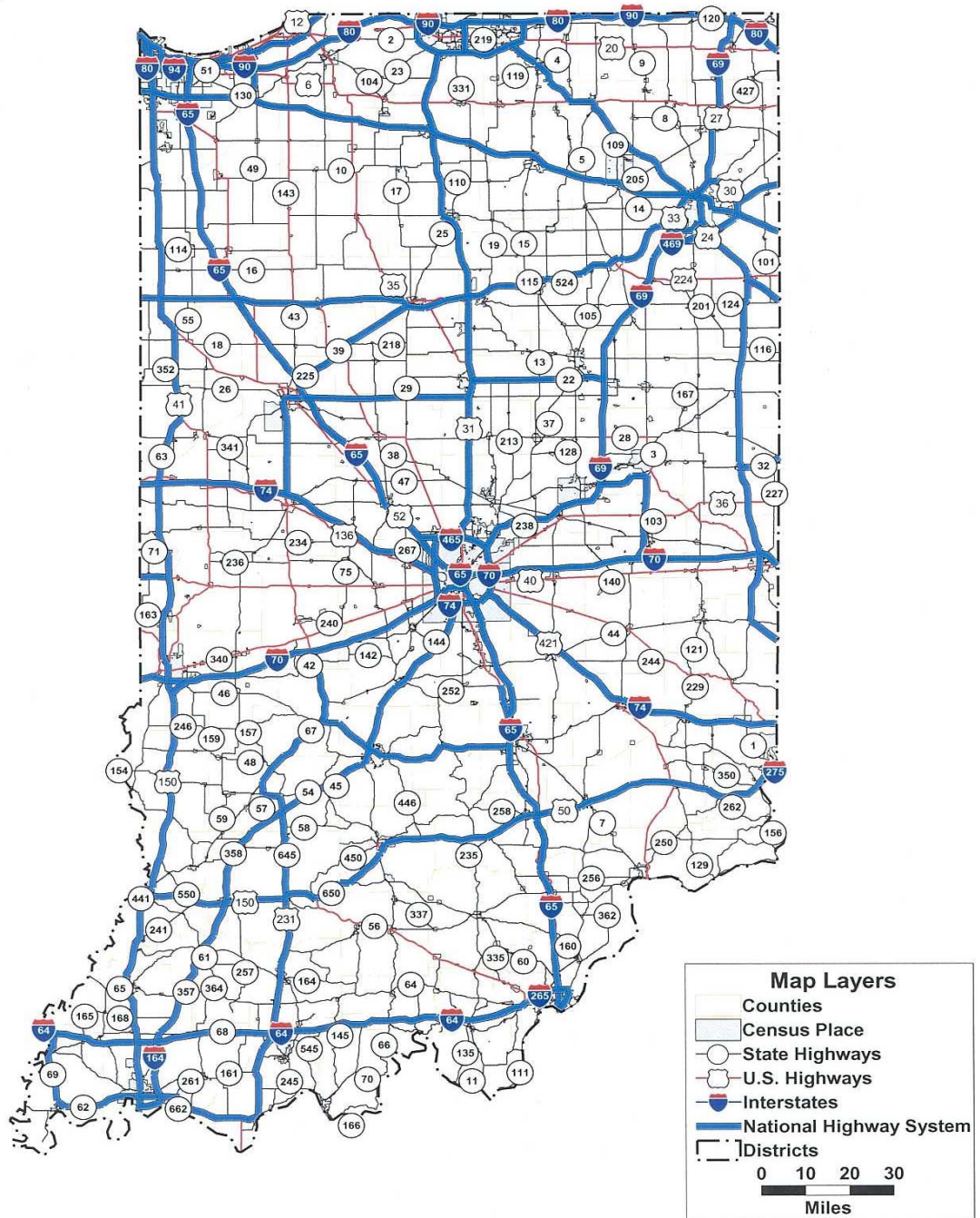
### **National Highway System**

National Highway System (NHS) is a system of highways determined to have the greatest national importance to transportation, commerce and defense in the United States. It consists of the Interstate Highway System, logical additions to the Interstate System, selected other principal arterials, and other facilities which meet the requirement of one of the subsystems with the NHS. The NHS represents approximately 4% to 5% of the total public road mileage in the United States. Therefore, the total Indiana mileage, like adjacent states, is somewhat restricted in terms of actual highway segments assigned to the National Highway System. Specifically, the National Highway System was designed to contain the following subsystems:

- P Interstate - - The current Interstate System retained its separate identity within the NHS along with specific provisions to add mileage to the existing Interstate subsystem.

Figure 6-7

## National Highway System



- P Other Principal Arterials - - These include highways in rural and urban areas which provide access between an arterial route and a major port, airport, public transportation facility or other intermodal transportation facility.
- P Strategic Highway Network - - A network of Highways which are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes.
- P Major Strategic Highway Network Connectors - - Highways which provide access between major military installations and highways which are part of the Strategic Highway Network.

Although the National Highway System as defined above is comprised of principal arterials, all of the designated Indiana principal arterial routes are not necessarily on the system. The portion of the Indiana mileage included on the system was dependent upon the total mileage that was established nationwide for the NHS.

The original exercises to determine the extent of the various state NHS mileages and route segments was related to the concept that the rural portion of the system should not exceed 4%, while the urban portion should not exceed 10% of the then existing principal arterial system. As expected, some States had systems much leaner than the average while others had systems that were much more extensive. In order to maintain some sense of equity or balance among States, principal arterial system reclassification was undertaken with maximum rural area road targets of 4% and maximum urban area road targets of 10%.

Naturally, this resulted in a nationwide principal arterial system greater than anticipated since States with lean principal arterial systems used that opportunity to increase the size of their systems to the maximum suggested limit that provided those states with a much more extensive system than others. This resulted in the condition that road density (area divided by road mileage) varied considerably from one state to another. Thus, a state with a dense system of roads (common in the Midwest and the Great Plains) that included the full 4% of its rural roads as principal arterials had a much more extensive system than a State with a lean road system (common in mountainous, desert and wetland areas).

Another factor that influenced the arterial classification of roads involved traffic density (VMT divided by road miles). Areas with higher traffic density required a higher percentage of their roads to provide for traffic service. By considering road density and traffic density combined, a much more equitable balance between the states was achieved and resulted in systems that were similar for similar states. Ultimately, states with lean systems added some minor arterials to their system. Indiana was not one of these states and still has some arterial roads that are not on the National Highway System. The NHS is shown in Figure 6-7. Not all segments of this system are on the state highway system.

### **Intermodal Connecting Links**

These are highways that connect NHS routes to major ports, airport, international border crossings, public transportation and transit facilities, interstate bus terminals and rail and intermodal transportation facilities.

## **Commerce Corridors**

A Commerce Corridor is that part of a recognized system of highways that relates to the following:

- Directly facilitates intrastate, interstate, or international commerce or travel;
- Enhances economic vitality and international competitiveness;
- Provides service to all parts of Indiana and the United States.

Consistent with the focus of supporting the State's economy, major commercial routes were selected with the objective of providing an interconnected network of high quality highways linking the activity concentrations within Indiana, and connecting those concentrations with major markets in surrounding states. The principles used to guide commerce corridor selection were as follows:

- Link Indiana's major population concentrations to the National Highway Network.
- Provide good accessibility to Indiana's major manufacturing concentrations;
- Provide good accessibility to Indiana's major trade and service concentrations; and
- Improve access to Indiana's major tourism and recreation areas, regional economic concentrations and those areas with demonstrated and anticipated potential for growth.

The major external markets for Indiana were considered to be urban areas over 600,000 in population and less than 500 miles from the state. Based on those criteria Indiana's major external markets are: Atlanta, Birmingham, Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Dayton, Detroit, Grand Rapids, Kansas City, Louisville, Memphis, Milwaukee, Minneapolis / St. Paul, Nashville, Pittsburgh, St. Louis, Toledo, and Toronto.

Access to Indiana's ports at Burns Harbor (Porter County), Southwind Maritime Center (Posey County), and Clark Maritime Center (Clark County) was included in defining the transportation corridors. These sites give Indiana access to international markets.

Within the major commercial corridors listed above, the routes that were selected to serve the defined concentrations involved routes that:

- Included all of the Interstate System;
- Avoided duplication of current Interstate and other major routes;
- Provided connectivity and continuity of the overall system; and
- Made use of high quality existing routes where appropriate.

In addition to these principles, access to important intermodal sites, such as the previously mentioned ports, were considered. The network resulting from these conditions, provided extensive geographic coverage and service to high traffic corridors. When these corridors were considered to be approximately 20 miles in width, it was determined that approximately 95 percent of the state's population lived within ten miles of the major commercial route network. Indiana's Commerce Corridors are depicted in Figure 6-8.



**Indiana's Commerce Corridors**

This map illustrates the state of Indiana with its major transportation infrastructure. The legend, titled "Map Layers", defines the following elements:

- Census Place:** Represented by yellow shaded areas.
- State Border:** Indicated by a dashed line.
- State Highways:** Represented by thin grey lines.
- U.S. Highways:** Represented by blue lines with red and white shields.
- Interstates:** Represented by thick blue lines with red and white shields.
- Commerce Corridors:** Represented by thick blue lines.
- Proposed Corridors:** Represented by dashed blue lines.

A scale bar at the bottom right indicates distances in miles, ranging from 0 to 30. The map shows a dense network of highways, particularly around the Indianapolis area, with numerous census places scattered throughout the state.

### **3R/4R Systems**

For long-range planning purposes, INDOT has evaluated the state highway system to determine which routes warrant rehabilitation (3R) and which routes warrant reconstruction (4R). In general, two major factors determine if a project should be classified as 3R or 4R. These factors involve:

- If 70% or more of the existing pavement area of the traveled way can be retained and resurfaced, the project may be classified as 3R. If not, the project is typically classified as 4R.
- An assessment of the level of service (LOS) for the 10 year traffic volume projection can determine if the project is 3R or 4R, based upon the expected service life of the pavement.

Generally, when the level of service (LOS) for a 10-year traffic volume projection on non-freeway routes is LOS D or better, the project design will involve the use of 3R geometric design criteria. If the projected LOS will not meet LOS D, the facility should be designed according to new construction/reconstruction or 4R design criteria.

On occasion, projects may contain both 3R and 4R work (combination projects) and the work classification and supporting design criteria should be based upon the predominant work type. A resurfacing project may include the replacement of one of the mainline bridges (4R criteria) and would generally be classified as a 3R project, unless the bridge is considered to be a major structure and its replacement cost is equal to or greater than that of the 3R resurfacing work.

All freeway projects (Interstate and limited access arterials) are generally classified as new construction, complete reconstruction, partial reconstruction or 3R as defined above.

### **National Truck Network**

The Surface Transportation Assistance Act (STAA) of 1982 required that the U.S. Secretary of Transportation, in cooperation with the State highway agencies, designate a national network of highways which allow the passage of trucks of specified minimum dimensions and weight. The objective of the act was to promote uniformity throughout the nation for legal truck sizes and weights on a National Truck Network. The truck network included all Interstate highways and a significant portion of what used to be referred to as the Federal-Aid Primary system that was built to accommodate large-truck travel.

In addition, the Act had required that “reasonable access” be provided along other designated routes to the commercial vehicles from the National Truck Network to terminals and to facilities for food, fuel, repair and rest and, for household goods carriers, to points of loading and unloading.

Under Indiana State Statutes, all principal arterials are available to commercial vehicles with the dimensions authorized, subject to local restrictions. In addition, the State has enacted legislation that stipulates that all public roads are legally available to these commercial vehicles subject to local restrictions.



## **STRAHNET**

The Strategic Highway Corridor Network (STRAHNET) is a system of highways, including the Dwight D. Eisenhower System of Interstate and Defense Highways, identified as strategically important to the defense of the United States. The system was identified by the Military Traffic Management Command Transportation Engineering Agency. The purpose of this national system is:

- In peacetime, to maintain the readiness of our fighting forces, to assist in the maintenance of a credible deterrent posture, and to enable the rapid mobilization of military forces during increased tension;
- In wartime, to gather and deploy personnel and equipment as needed; and;
- To support industrial mobilization.

This military road network uses the Interstate System in Indiana and, since the Interstate System does not go directly to the military bases, a connector system is required. The NHS includes the STRAHNET system and its Primary Connectors to Priority One and Two military installations in response to a federal requirement that these routes be included. Those portions of the National Highway System designated as STRAHNET and its Primary Connectors are depicted in Figure 6-9.

## **Heavy Duty Road Network**

INDOT has been authorized to designate highways having fixed maximum weights of vehicles that may be transported on those highways. However, authorization is limited to those highways that have been constructed and maintained in such condition that the designated use will not materially decrease or contribute materially to the decrease of the ordinary useful life of that highway.

Segments of the following state roads depicted in Figure 6-10 include US 12, US 20, US 31, US 41, SR 2, SR 23, SR 39, SR 149, SR 249, SR 312 and SR 912.

## **National Scenic Byways**

The National Scenic Byways Program recognizes highways that are outstanding examples of our nation's beauty, culture, and recreational experience in exemplifying the diverse regional characteristics of our nation. These highways, nominated by the states and federal land management agencies are designated by the U.S. Secretary of Transportation to provide a compass for people from all over the world to explore America's treasured open roads. These roads possess characteristics that are considered America's best.

Currently, Indiana has two highways so designated that include US 40 (156 miles of the Indiana National Road) from the Illinois State Line to the Ohio State Line and portions of SR 62, US 41, I-64, SR 66, SR 56 and SR 156 (302 miles of the Ohio River Scenic Route) also from the Illinois State Line to the Ohio State Line. Indiana's National Scenic Byways are shown in Figure 6-11.

Figure 6-9

**Strategic Highway (STRAHNET) Corridor Network**

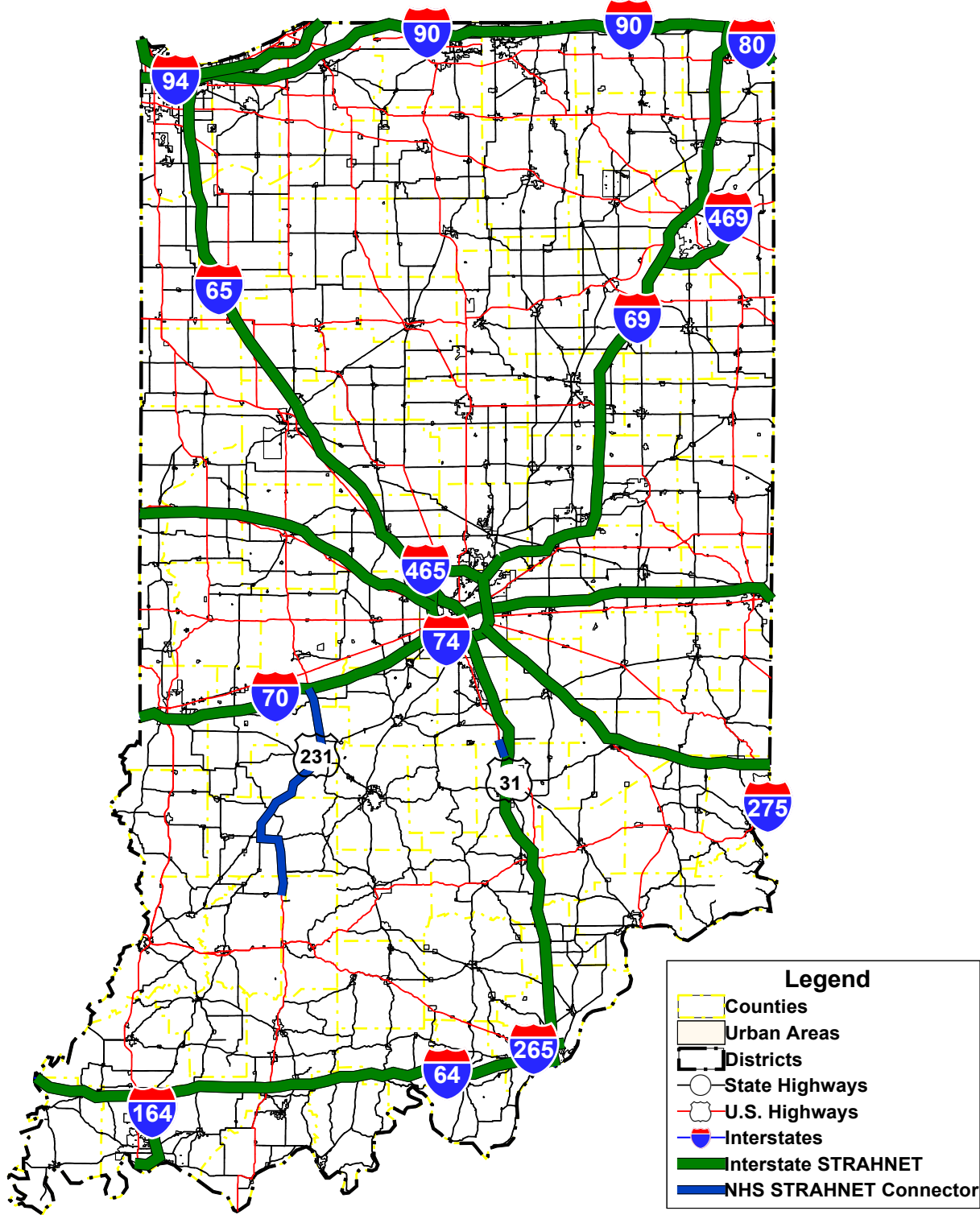


Figure 6-10

# Indiana's Heavy Duty Truck Network

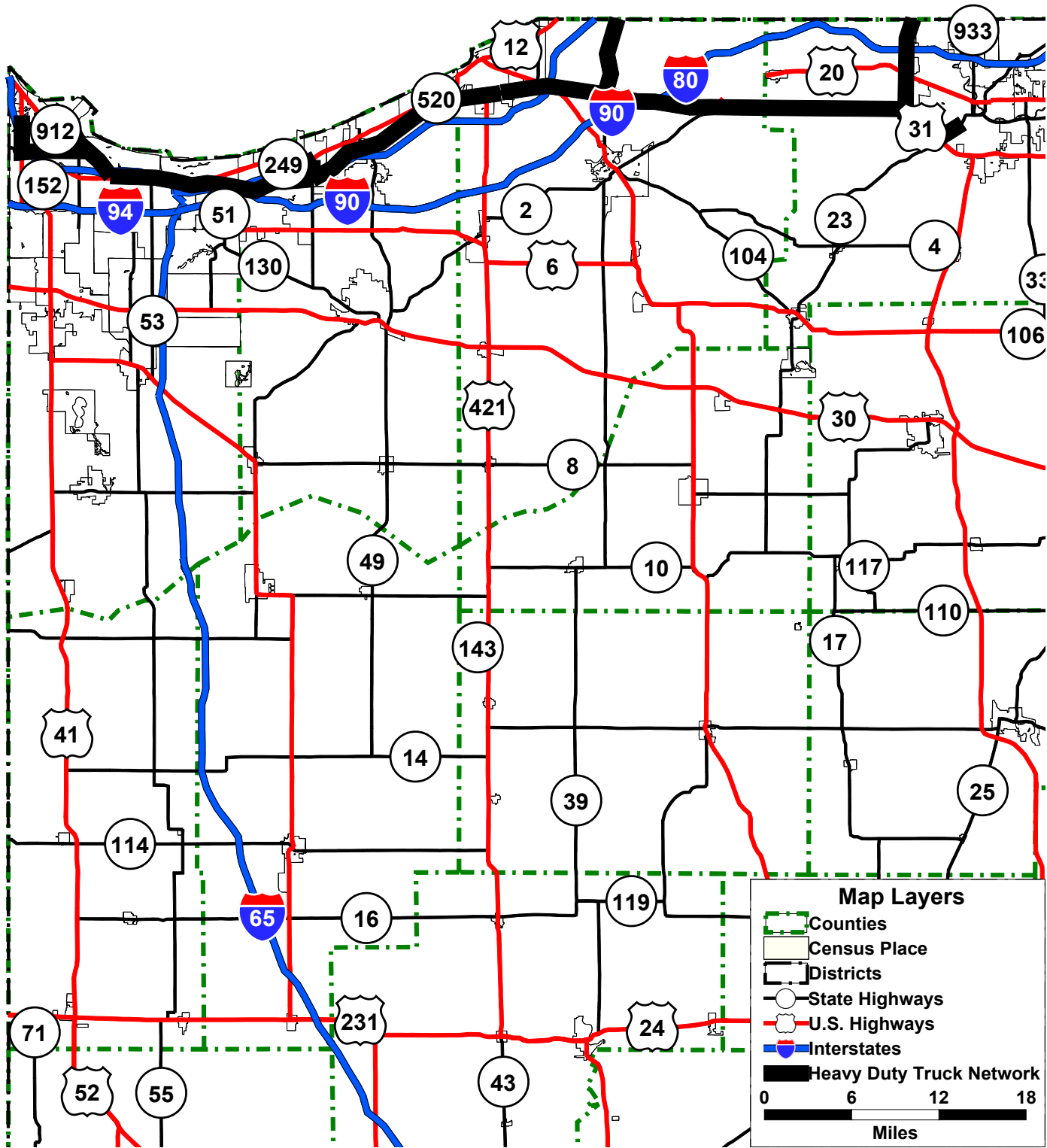


Figure 6-11

# Indiana's National Scenic Byways

